

### **REMARKS**

Claims 1-11 are pending. The office action rejected claims 1-9 and objected to claims 10 and 11. For the reasons below, Applicants respectfully traverse the rejection of the application and request allowance of the application.

#### **Claims Rejections – 35 USC § 102**

Claims 1 and 6 have been rejected under 35 USC §102(b) as being anticipated by Karnaugh et al. According to the Examiner, Karnaugh discloses the claimed invention:

“Regarding claims 1 and 6, Karnaugh et al. discloses a data receiver (Fig. 1A, 1B) comprising the following claimed limitations: a plurality of distinct filters selectably coupled to the input and the output (F1, F2) wherein each one of the plurality of filters has a different set of pre-calculated filter coefficients (33-35); a switching circuit (43, 45, 58) that selects one of the plurality of distinct filters based on an error signal (42).”

Applicant respectfully traverses the Examiner’s reading of Karnaugh. Karnaugh discloses a data receiver that passes digitized samples through an interpolating filter whose coefficients are selected according to various factors such as timing error. (See Abstract) The Examiner makes specific reference to filter coefficients (33-35). Figures 1A and 1B show filters F1, F2 whose coefficients are selected from stores 33-35 based on the position of selector switches 46, 47. (See column 8, line 59-66) The filter selection process is continually updated, and the filter coefficients are automatically changed when necessary. (See column 2, lines 10-14) The selection of the appropriate filter

coefficients is performed automatically in response to a timing error estimation process. (See column 8, lines 15-17) In other words, the filter coefficients assigned to the filters are **not** pre-calculated or fixed in value, rather, they are constantly changing and assigned based on a timing error.

In sharp contrast, Applicant's invention, as recited in claim 1, discloses a channel estimator that include a plurality of distinct filters each having a different set of pre-calculated filter coefficients. The claimed invention exhibits advantages over the prior art because the filter coefficients are fixed and pre-calculated. For example, the structure of the channel estimator of the present invention guarantees a short convergence time since it does not calculate coefficients or modify existing coefficients.(See page 6, lines 9-16 of the Summary section of the present invention). Convergence time refers to the time needed by a channel estimator to generate an estimated waveform. A channel estimator having a long convergence time will often generate a channel response that no longer exists making the process more prone to errors.

Further, in the present invention, because each filter has different set of coefficients and different filter characteristics, the channel estimator is able to adapt to varying channel conditions while providing a relatively short convergence time. In fact, the present invention points out some deficiencies of some prior art channel estimators such as a technique used by the estimator of Karnaugh. For example, the estimator of Karnaugh is not only complex but also takes an inordinately long time to converge. In sum, the present invention provides fixed pre-calculated filter coefficients resulting in short convergence time, whereas in Karnaugh, the filter coefficients are constantly being modified resulting in a longer convergence time than in the claimed invention.

onsequently, Karnaugh fails to teach or suggest claims 1 and 6, and thus does not anticipate the claimed invention for at least the above reasons.

#### Claims Rejections – 35 USC § 103

Claims 2-5 have been rejected under 35 USC § 103(a) as being unpatentable over Karnaugh et al.

Claims 7-9 have been rejected under 35 USC § 103(a) as being unpatentable over Ghosh in view of Karnaugh et al.

The Examiner contends that Karnaugh, alone or in combination with Gosh, teaches or suggests claims 2-5 and 7-9. As outlined above in response to the Examiner's rejection under 35 USC § 102(b), Karnaugh does not anticipate claim 1. Thus, for at least the same reasons as claim 1, Karnaugh, alone or combination with Gosh, fails to teach or suggest dependent claims 2-5 and 7-9 of the present invention.

#### Allowable Subject Matter

The Examiner has indicated that claims 10 and 11 would be allowable if rewritten in independent form including all of the limitations of the base claims and any intervening claims.

The Applicants thank the Examiner for the allowable subject matter. However, for the reasons given above, Applicants decline rewriting claims 10 and 11.

#### Request for Reconsideration pursuant to 37 CFR 1.111

Having responded to each and every ground for objection and rejection in the Office Action mailed on February 4, 2004, Applicant requests reconsideration in the instant application pursuant to 37 CFR 1.111 and requests that the Examiner allow claims 1-9 and pass the application to issue. If there is any point requiring further attention prior to allowance, the Examiner is asked to contact Applicants' counsel who can be reached at the telephone number listed below.

Respectfully,  
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